

Application No. 10/766,505
Response dated June 19, 2007
Reply to Office Action of March 23, 2007

Listing of Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims **1-25** (canceled).

26.(currently amended) An ICP source comprising [the electrical-circuit inductor of claim **25** and further comprising]:

an inductor having a conductor formed of a sheet of electrically conductive material in the shape of at least one loop having opposite edges encircling an axis, the sheet having:

a gap extending between the opposite edges and defining a pair of terminal ends, and

a pair of RF connectors, one fixed to each of the terminal ends; and the opposite edges including an inner edge and an outer edge, each having a plurality of cutouts therein that require RF current flowing between the terminal ends to flow around the outside of the cutouts in the inner edge and around the inside of the cutouts in the outer edge, wherein:

the cutouts are alternately spaced in the inner and outer opposite edges, the cutouts in the outer edge extend sufficiently radially inward to interrupt the shortest current paths around the outside of the cutouts in the inner edge,

the cutouts in the inner edge extend sufficiently radially outward to interrupt the shortest current paths around the inside of the cutouts in the outer edge;

the opposite edges thereby define a sinuous serpentine conductive path that alternately curves inwardly around the outside of the cutouts in the inner edge and curves outwardly around the inside of the cutouts in the outer edge, in a plurality of oscillations between the terminal ends; and

the at least one loop includes a series of segments of alternating high and low cross-sections and widths;

an RF power source connected across the ends of the conductor;

a dielectric window having a vacuum chamber side and an outside;

the inductor being [adjacent the] outside of the dielectric window, generally

congruent thereto, the widths being generally parallel to the dielectric window and the thicknesses being generally perpendicular to the dielectric window.

27.(currently amended) An ICP apparatus comprising [the inductor of claim 25 and further] comprising:

 a vacuum processing chamber having a chamber wall having a dielectric window therein;

an RF power source connected across the ends of the conductor;

a dielectric window having a vacuum chamber side and an outside;

an inductor having a conductor formed of a sheet of electrically conductive material in the shape of at least one loop having opposite edges encircling an axis, the sheet having:

a gap extending between the opposite edges and defining a pair of terminal ends, and

a pair of RF connectors, one fixed to each of the terminal ends; and
the opposite edges including an inner edge and an outer edge, each having a plurality of cutouts therein that require RF current flowing between the terminal ends to flow around the outside of the cutouts in the inner edge and around the inside of the cutouts in the outer edge, wherein:

the cutouts are alternately spaced in the inner and outer opposite edges,

the cutouts in the outer edge extend sufficiently radially inward to interrupt the shortest current paths around the outside of the cutouts in the inner edge,

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the cutouts in the inner edge extend sufficiently radially outward to interrupt the shortest current paths around the inside of the cutouts in the outer edge;

the opposite edges thereby define a sinuous serpentine conductive path that alternately curves inwardly around the outside of the cutouts in the inner edge and curves outwardly around the inside of the cutouts in the outer edge, in a plurality of oscillations between the terminal ends; and

the at least one loop includes a series of segments of alternating high and low cross-sections and widths; and

the inductor being outside of the chamber, generally congruent to the dielectric window, the widths of the segments being generally parallel to the dielectric window and thicknesses of the segments being generally perpendicular to the dielectric window.

28.(new) An ICP source for a processing apparatus comprising:

an electrical-circuit inductor having an electrical conductor in the shape of at least one loop having opposite edges encircling an axis and providing a sinuous, oscillating, serpentine path around the axis that is defined by a pair of opposite edges;

a pair of terminal ends at opposite ends of the conductor, each end having an RF connector fixed thereto;

the opposite edges including an inner edge and an outer edge, each edge having a plurality of cutouts therein, alternately spaced in the inner and outer opposite edges, that require RF current flowing between the terminal ends to flow in an outwardly curving path segment around the outside of the cutouts in the inner edge and in an inwardly curving path segment around the inside of the cutouts in the outer edge;

an RF power source connected across the ends of the conductor;

a dielectric window forming part of a chamber wall and having a vacuum chamber

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side and an outside; and

the inductor being outside of the dielectric window, generally congruent thereto.

29.(new) The ICP source of claim **28** wherein:

the cutouts in the outer edge extend sufficiently radially inward to interrupt the shortest current paths around the outside of the cutouts in the inner edge; and

the cutouts in the inner edge extend sufficiently radially outward to interrupt the shortest current paths around the inside of the cutouts in the outer edge.

30.(new) The ICP source of claim **28** wherein:

the conductor includes a series of lengths of alternating high and low cross-sections and widths;

the cutouts in the outer edge extend sufficiently radially inward to interrupt the shortest current paths around the outside of the cutouts in the inner edge; and

the cutouts in the inner edge extend sufficiently radially outward to interrupt the shortest current paths around the inside of the cutouts in the outer edge.

31.(new) The ICP source of claim **28** wherein:

the conductor includes a series of lengths of alternating high and low cross-sections and widths.

32.(new) The ICP source of **31** further comprising:

the widths being generally parallel to the dielectric window and the thicknesses being generally perpendicular to the dielectric window.

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33.(new) An ICP apparatus comprising the ICP source of **28** and further comprising:
a vacuum processing chamber having a chamber wall having the dielectric window
therein and the inductor being outside of the chamber.